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For a successful space program : Quality and Safety! (1)

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PAYLOAD FOCUSED PDR PROCESS FOR SMALL SATELLITE MISSIONS IN NEW SPACE

Abstract

SeRANIS is not a classical mission in terms of project schedule, but rather a fast-paced hybrid small satellite mission with modular payload and COTS platform. Therefore, the PA must also be different to keep up with the speed of the project. Thoughtful and creative methods must be employed to allow easy and convenient review of the project while ensuring mission quality and safety. With a focus on modular payload development, the criticality for mission failure due to reliability decreases. This allows for adaptation and redefinition of traditional PA methods. For the Preliminary Design Review (PDR) specifically, SeRANIS takes a different approach with a non-document based approach through a centralized online tool to collect and review the required information. Combined with in-person review, this provides the opportunity to increase the depth of review while reducing the bureaucratic burden of reviews and documents to be provided. Experimenters are given more freedom to develop their instruments and reduce the required workload, whereas small satellite missions may not even have additional manpower.

In this study, a PDR-level analysis of PA for small satellite missions is presented with a focus on the payload in new space. A brief introduction to the observation of the conducted SeRANIS PDR is given with a focus on organization, preparation, execution, and post-processing with respect to PA. Then, a detailed comparison between the traditional PDR and the SeRANIS approach to PDR will be performed. Lessons learned with this method are also presented: Does it work and how is the associated risk managed in terms of design and development? . This will form the basis for future research of the next project milestones.